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Disaster Study Number 1

**Human Behavior in Extreme Situations:
A Survey of the Literature and Suggestions
For Further Research**

ANTHONY F. C. WALLACE

Committee on Disaster Studies

**National Academy of Sciences—
National Research Council**

Publication No. 390

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The Committee on Disaster Studies is a committee of the Division of Anthropology and Psychology, National Academy of Sciences—National Research Council. It was established as the result of a request made of the Academy—Research Council by the Surgeons General of the Army, the Navy, and the Air Force, that it "conduct a survey and study in the fields of scientific research and development applicable to problems which might result from disasters caused by enemy action."

The function of the Committee is to aid in developing a field of scientific research on the human aspects of disaster. The Committee maintains a clearinghouse on disaster research, publishes a roster of scientific personnel in the field of disaster research, and issues periodically a Newsletter. It makes modest grants to encourage research in disaster studies, advises with responsible officials on problems of human behavior in disaster, and from time to time issues reports on the results of disaster research.

At present its activities are supported by a grant from the Ford Foundation, and by special grants from the National Institute of Mental Health of the Department of Health, Education and Welfare, and from the Federal Civil Defense Administration.

Disaster Study Number 1
Committee on Disaster Studies
Division of Anthropology and Psychology

A Study of the Literature

and Suggestions for Further Research

HUMAN BEHAVIOR IN EXTREME SITUATIONS

by

Anthony F. C. Wallace
University of Pennsylvania

Publication 390

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PREFACE

This is the first in a series of disaster study reports to be published by the Committee on Disaster Studies. This series is designed to make the findings of disaster research more accessible to research workers and to agencies and officials concerned with disaster problems. It includes studies which have been completed for some time but which have not previously been published, as well as recently-completed studies. The study reported herein was supported by the Committee under Contract Number DA-49-007-MD-256 between the Department of the Army and the National Academy of Sciences-National Research Council.

Dr. Anthony F. C. Wallace, then of the Behavioral Research Council, University of Pennsylvania, was commissioned by the Committee in 1953 to prepare a comprehensive bibliography on "human behavior in extreme situations." Dr. Wallace prepared a bibliography of approximately 10,000 items, which has since been increased to approximately 13,000 items. Approximately one-fourth of the titles are annotated and all of them are arranged on Keysort cards for ready use and cross-referencing. This bibliography is used by the Committee's Clearinghouse of Disaster Studies to assist agencies and research workers on bibliographic and reference needs.

In the present report, Dr. Wallace summarizes the types of literature available to students of human behavior in extreme situations and points up the potential uses and limitations of the existing bodies of literature. To this he adds some seminal ideas of his own concerning hypotheses, needs, and limitations in disaster research. A large demand for Dr. Wallace's critique has indicated that it is especially helpful in providing guidance as to the pertinence and location of the different types of literature to those who are just commencing work in the field of disaster.

The issuance of this report does not necessarily indicate concurrence of every member of the Committee on Disaster Studies in every statement made in the report, nor does publication imply Department of Defense indorsement of factual accuracy or opinion.

Carlyle F. Jacobsen
Chairman
Committee on Disaster Studies

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HUMAN BEHAVIOR IN EXTREME SITUATIONS:

A Survey of the Literature and Suggestions for Further Research

By

Anthony F. C. Wallace

Situations involving the threat of, or experience of, an interruption of normally effective procedures for reducing certain tensions, together with a dramatic increase in tensions, to the point of causing death or major personal and social readjustment, may be called "extreme situations." Such situations may occur in almost any social context or in connection with any felt need, and may involve a single individual or a whole population. We are concerned here with extreme situations affecting groups of people; such extreme situations, especially when they involve injury or death, are often called disasters.

Human behavior in extreme situations has been a relatively neglected area of study in the social and psychological sciences, although certain types of extreme situations are common. Large parts of the earth's present population have experienced disaster in the form of epidemic, flood, earthquake, financial panic and

depression, mob violence, fire, imprisonment, starvation, military defeat and occupation, or air attack. Such events have not been infrequent in past centuries, and no doubt millenia; their weight as determinants of human history may be considerable.

It is evident, from a glance at popular literature such as newspapers, myths, and fictional tales, that much public attention has been devoted to disasters in a number of societies; and in most nations many public agencies -- relief organizations, local, state and national governmental establishments, insurance companies, industrial firms, and labor unions -- are concerned with preventing or mitigating their effects (or, in the case of military establishments, with producing situations of extremity for an enemy). Nevertheless, in spite of the generality of concern with the problem, until recently little scientific work had been published in the field of human behavior in extreme situations. I shall discuss certain possible explanations for this relative lack of scientific interest later.

During and since World War II, however, under the specific impetus of the threat of air attack on American and British cities, several research centers in this country and abroad have approached the problems of human behavior in extreme situations, and although many of their reports are not published or are under military classification, the initial results have been encouraging. A few

of the disaster projects in this country may be mentioned, to give an idea of where and on what scale this work is being done: the RAND Corporation has been carrying out a Crisis and Disaster Study; in Project East River several universities in the New York area participated in a study of civil defense; the National Opinion Research Center at the University of Chicago has for several years been operating a disaster research program; the University of Maryland has had a disaster research program, largely staffed by personnel from the Psychiatry Department; the Survey Research Center at the University of Michigan has made a study of public opinion in relation to civil defense; a survey was made at Cornell University of American public reaction to the atomic bomb; the U. S. Strategic Bombing Survey, both in Europe and the Far East, investigated social and psychological effects of air attack; the National Research Council and the American Association for the Advancement of Science have held symposia on disaster research; the University of Oklahoma, the New School for Social Research, the Bureau of Applied Social Research at Columbia, the Institute for Research in Human Relations in Philadelphia, Civil Defense Research Associates, Inc., the Washington Public Opinion Laboratory, and the Operations Research Office at Johns Hopkins are among other centers where disaster research has been carried on.¹

¹See Louttit, 1953, for roster of research and administrative personnel in disaster studies.

In 1951 the Surgeon-General's Office in the Department of Defense asked the National Academy of Sciences-National Research Council to conduct a survey and study in the fields of scientific research and development applicable to problems which might result from disasters caused by enemy action, including: (a) reviewing, analyzing, and evaluating the programs of research and development therein conducted under the auspices of private or governmental organizations or agencies in the United States or abroad; (b) proposing additional fields of investigation within these general fields, and additional projects for research and development therein; and (c) collecting, collating, and disseminating scientific and technical information in these fields. A Committee on Disaster Studies was established, of which the present chairman is Dr. Carlyle F. Jacobsen, to aid in coordinating the work of various groups (including some of those mentioned above), to act as a clearing house for disaster research, and to conduct certain lines of inquiry with its own limited staff (Fenton, 1952). In the spring of 1953, as one of the activities of this committee, Dr. William N. Fenton, anthropologist, Executive Secretary of the National Research Council's Division of Anthropology and Psychology; Mr. Harry B. Williams, sociologist, Technical Director of the Committee on Disaster Studies; and Dr. C. M. Louttit, psychologist, Chairman of the Sub-committee on Clearinghouse, requested

the writer to prepare a bibliography on disasters and an evaluation of the literature. The bibliography itself, amounting to about 10,000 items coded on 5"x8" "Keysort" cards for disaster identity number, type of impact agent, certain theoretical topics, and type of descriptive information is now maintained by the Committee on Disaster Studies of the National Research Council. The present paper constitutes a general evaluation of the literature as listed in the bibliography; and, based on this and other observations, discussion and suggestion for the further study of human behavior in extreme situations.²

²I wish to make acknowledgement to Dr. Fenton, Mr. Williams, and Dr. Louttit; to Mrs. Sheila Steen, my chief assistant in preparing the bibliography; and Miss Jeannette Rayner, of the Disaster Committee Staff, for their great help both in practical matters and in discussion. I am also grateful to the several other persons who worked with me on the bibliography for their efficiency and loyalty to "Project Packrat." See Wallace, 1953, for a systematic guide to the bibliography. The opinions expressed in this paper are my own and do not necessarily reflect the views of the National Research Council.

THE MAJOR TYPES OF LITERATURE

By far the bulk of the publications on disaster are to be found in the popular press: magazines, newspapers, and trade books designed for a casual audience. These journalistic accounts of fires, floods, earthquakes, epidemics, explosions, and other distressing events vary in quality, some containing only a few photographs, or a brief but sensational statement of impact agent, location, casualties, and freakish happenings, and others approaching scholarship in their scope and incisiveness of observation. John Hersey's Hiroshima (1946), for example, although it is avowedly journalism and is devoted to the presentation of six "human interest" case histories whose representativeness is questionable, nevertheless succeeds in describing many significant aspects of the first atomic bombing which are slighted in the more systematic reports of the U. S. Strategic Bombing Survey. As raw research data and as a source of insights worthy of more careful pursuit, therefore, journalists' descriptions, if critically used in conjunction with other materials, can be extremely valuable. This is particularly true of the newspaper and radio accounts of a disaster published by the local press and broadcasting stations; here one may find a great many concrete details based on interviews made immediately following the event. Following the Worcester tornado disaster in 1953, for instance, the local Telegram

and Gazette published hundreds of pages of factual information: the experiences of survivors, casualty lists, evacuation lists, summaries of physical damage, activities of relief organizations, blow-by-blow descriptions of ensuing political imbroglios in the town, etc. And WTAG, an affiliated radio station, provided me with about four hours of tape recordings of reporters' accounts of their own observations and of interviews with disaster victims and survivors. This material, systematically and critically analyzed, would be of great importance to any research into the events at Worcester.

Closely allied to the popular journalism described above is another large category which can be called "technical journalism." Many organizations publish, in house organs like the American Red Cross's Disaster or in trade journals, descriptive and public relations information of varying degrees of technicality, ranging from bare statements of financial expenditures to rather formal analyses of the role of their product or organization in a disaster. Thus, for instance, following the Texas City explosion, the Southern Funeral Director, 51 (1947): 17, published an article entitled "FD's Earn Praise and Gratitude for Untiring Service During Disasters"; the National Underwriter published in 1947 no less than 9 articles on insurance problems of the explosion; Medical Economics, 24(1947): 70-75, had an article on the role of three clinics

in treating the injured; and so on. In spite of the triviality of some of the material, and the obvious public relations intent in other, this sort of data would be worth using in any investigation of the total disaster experience of the community.

Intermediate between the journalistic and the scientific accounts, and often maintaining some of the best characteristics of both, are what may be called "scholarly" studies of disaster. They do not aim to titillate the jaded fancies of tabloid or weekly news-magazine readers, but neither do they pretend to probe systematically relationships between factors determining human behavior in extreme situations. They have little or no framework of theory, and are descriptive in the best sense of the word, being content to use the observations of lay participants and observers of the event without sociological or psychological interpretation and reformulation. Scholarly studies, usually historical, show great care in the critical use of sources, the cross-checking of testimony, and the piecing together of widely-scattered bits of information to form a coherent picture of the disaster. Examples of the best of this class of literature are such works as John Powell's Bring Out Your Dead (1949), a study of the yellow fever epidemic in Philadelphia in 1793; narratives of military catastrophe, such as S. L. A. Marshall's The River and The Gauntlet (1952), an account of the disastrous American retreat from the Yalu River;

or Gibbon's Decline and Fall of the Roman Empire, a classic study of national disintegration. In general, the scholarly studies deal with either a series of disasters of one type (such as floods, tornadoes, epidemics, strikes) over an extended period of time in one region, or else describe specific disasters of a kind (like wars, epidemics, sieges, and military campaigns) in which the impact is sufficiently protracted to allow people in the affected area to observe and make extensive records of their observations, and for outside observers to come in while the impact is still going on.

Journalistic and scholarly accounts thus constitute a vast reservoir of empirical information on hundreds of disasters, many of them of considerable known historical importance, from which scientists can draw data for their own studies. Nevertheless, the complete bibliography of published journalistic and scholarly accounts of any major disaster will need to be amplified, if a scientific researcher wishes to make an analysis of the event in terms of a specific hypothesis, by recourse to field interviews, unpublished documents, diaries, letters, court records, agency files, insurance investigations, committee minutes, etc.

By "scientific" studies I mean studies, conducted by professional social and psychological scientists, which employ the concepts, categories of observation, and research techniques of these disciplines, and (usually) attempt to discover how certain variables

of human behavior affect or are affected by extreme situations of one sort or another. There is still relatively little literature of this kind. What there is can be divided into three somewhat overlapping groups: empirical descriptions of specific disasters or aspects thereof; studies of factors (like panic, leadership, morale, culture contact) which can be partial determinants of human behavior in extreme situations; and efforts to create or infer theoretical models for extreme situations as a general class of phenomena.

There are a number of particular disasters which have been extensively investigated and described by social and psychological scientists. In most cases, however, the coverage is composed of the reports of several independent investigators, working with different interests, techniques, and assumptions; only by pooling a number of articles, monographs, and books can a fairly well-rounded reconstruction of the event be made. Among the best of this order are the group of studies of the relocation centers for persons of Japanese ancestry in the United States during World War II; the various economic, social, and psychological studies of the great American depression, 1929-1937; the studies of psychiatrists, psychologists, sociologists, social workers, et al. of the bombing of Britain and the evacuation of the British urban populations during World War II; and the studies of the German concentration camps prior to 1945. While these groups of monographs are

rather disjointed, they approach problems with concepts and hypotheses which are familiar to the academic and clinical disciplines, and to varying degrees are based on systematic field investigations rather than purely documentary research or journalistic reports.

Scientific studies of factors or processes which can be integral elements of any extreme situation constitute an extensive and scattered body of literature from specialties within psychiatry, general medicine, psychology, sociology, anthropology, economics, and political science. Such matters as perceptive processes, panic, morale, leadership, informal small-group organization, rumor, communications, social disorganization, psychopathology, etc., are subjects which could profitably be included in the panel of phenomena to be observed in the study of any disaster. Most of the work on these subjects, however, has not been done with disaster in mind as the point of application, and consequently many subjects are represented by enormous bodies of literature, much of which is relevant to, but little of which explicitly bears on disaster itself. Thus for example there is a considerable amount of literature on the factors affecting perception, including stress factors (e. g., Postman and Brunner, 1948), which has an obvious bearing on disaster studies, but whose applicability is uncertain because the observations were not made under disaster conditions.

The existence of this scientific literature must be kept in mind, even though only a fraction of it can be included in a disaster bibliography.

A small body of scientific publications can be called "disaster theory," since it explicitly treats of the general structure and effects of disaster as a class of phenomena, and of the role of specific factors in disaster. These are sometimes studies based on observations of a single disaster; some are comparative; none go very far toward the formulation of general theory of human behavior in extreme situations. Much of the earlier (pre-World War II) theory about disaster bore on the role of disaster in precipitating or forcing social and cultural change; notable examples of this approach are Prince (1920), Carr (1932), and Sorokin (1942). Representative of the more recent socio-psychological ambit are Powell and Rayner, 1952 (a conceptual scheme for the comparative and analytical treatment of the time-dimension in disaster); Janis, 1949 and 1951 (studies of the psychological effects of air attack); Killian, 1952 (the significance of multiple group-membership in disaster); Hudson, n.d. (perception in extreme situations); Tyhurst, 1951, and Leighton, 1951 (psychological and psychiatric aspects of individual behavior under the stress of disaster); Meerloo, 1950 (a study of emotional factors in panic); Cantril, 1940 and 1943 (studies of the social-psychology of panic); Bettelheim, 1943, and

Nirembeski, 1946 (psychopathology of concentration camp regimes); Walter Reed Army Medical Center, 1953 (a symposium on stress).

There is a curious lack of correlation between the best descriptive and the theoretical literature. Analyzing the scholarly and scientific descriptive literature by type of impact agent (earthquake, epidemic, explosion, etc.), it appears that the most thoroughly and extensively described particular disasters are those in which the period of impact is relatively prolonged and in which large areas are affected. Brief and sudden impacts, no matter how disastrous, rarely receive as much or as careful description. Nevertheless, although the empirical research resources are greater for this type of "prolonged" disaster, the majority of works attempting to analyze disaster in theoretical terms are oriented toward the kind of disaster in which the impact agent is relatively sudden, brief, and productive of maximal physical destruction; air raids, tornadoes, explosions, fires, etc.

SPECIFIC WEAKNESSES OF THE EXISTING LITERATURE

Earlier I have drawn attention to the relative recency of scientific studies of human behavior in extreme situations. This recency of interest is I suspect owing in part to the circumstance that disasters, and extreme situations generally, have not fallen readily within the traditional Weltanschauung of the social and

psychological sciences. Anthropology, psychology, and sociology in particular have by and large concerned themselves with structural ("culture," "social system," "personality") or distributional (population, questionnaire responses, statistically organized data) patterns or norms within various classes of events.

Now disasters are, from the standpoint of most of the things the behavioral sciences have been interested in until recently, breaks in pattern. While actually they form a class in themselves, about which generalization can and should be made, they are so rare in comparison with the events that make up the generality of human experience that their existence as a class is less evident than their abnormality with respect to other classes. Viewed not as a type of event, but as isolated and annoying interruptions of norms, they present themselves only as unique happenings, hanging in a sort of conceptual limbo. The behavioral scientist thus has trouble developing an interest in them, because he tends not to recognize them as a class but only as isolated events -- and he is not interested in individual events except as they illustrate a traditionally recognized pattern area. The journalist and the historian, and to an extent the psychiatrist, are interested in the structure of individual events as well as in patterns among events, and so have always been concerned with human behavior in extreme situations. But the behavioral scientist has had great difficulty in

coming to grips with them, as he has not recognized the possibility of identifying pattern, and has no equipment for handling them as single happenings, of interest in themselves.

Another factor which in some measure probably has helped to hold back studies of human behavior in extreme situations is the frequent presence in such situations of extreme feelings and behavior. Injury, pain, and death; fear and panic; disturbed and pathological emotional states; unconventional sexual behavior; bereavement and loss; irrational dependencies and hostilities; courage and cowardice, are themes a little too "raw" for the ritualistic treatment social science data generally get under the name of "objectivity," "methodological rigor," and "theoretical relevance." The social and psychological sciences, by and large, do not handle this sort of thing very comfortably, as is evidenced, for example, in the history of their reaction to the literature of psychoanalysis. We tend to look the libido theory, "the" Oedipus complex, the id-ego-super-ego structure and dynamics in the face and pass on, remarking that they are "untested" theories; while we have incorporated the concepts and vocabulary of the equally "untested" mechanisms of defense into our basic textbooks. Defenses seem to be easier to believe in than are the things they defend one against. Generally speaking, the popular and even scholarly literature has been less remote from the emotional and behavioral realities of disaster than have the academic disciplines of human behavior.

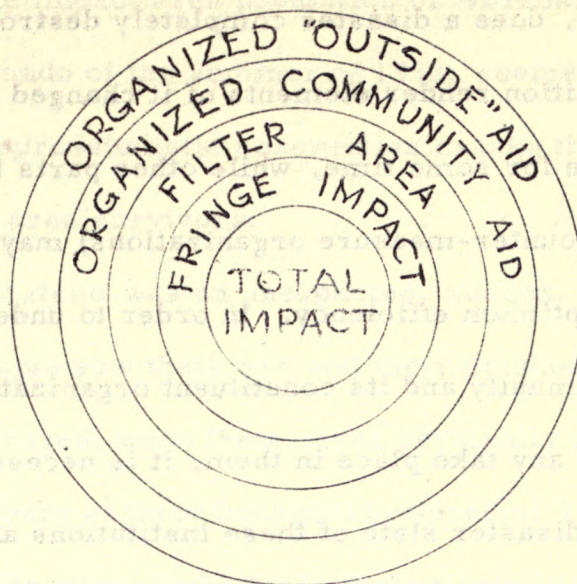
If the scientific literature is weak on account of its sparsity and over-intellectualization of primary phenomena, the popular and scholarly literature is to be criticized for its disorientation in time and space. There is much confusion in the descriptive literature (and this includes, though to a lesser degree, the scientific part of it as well) because time and space coordinates are not plotted carefully. Authorities contradict one another about such things as panic, apathy, the silence or moaning or screaming of the wounded, and so forth, probably because they are talking about different places and different times. Rarely does one find the succession of happenings which constitutes a disaster carefully mapped and time-logged. Some of this carelessness is doubtless owing to the disorientation of participant observers and informants. Part no doubt is owing to the lack of a generally accepted conceptual structure of disaster as a type of event, two (or four) dimensions of which are space and time, and the concomitant primitiveness of social science techniques for describing a whole event as a Gestalt from several points of view.

DESIDERATA OF AN ORGANIZED APPROACH TO DISASTER STUDIES

Disaster (and more generally human behavior in extreme situations) is a type of event which can be described or measured along many different dimensions, and in terms of many variables.

In order to compare disasters, classify their variations, and determine how constituent factors act and interact, it is necessary to formulate a general theoretical model which defines what these dimensions and factors are. It should be possible to describe, under the categories of this model, any disaster as a total event, leaving blank no major portions of time or space, nor any major dimensions of social structure or individual emotion and behavior which can be observed. While it is obvious that no disaster (and, indeed, no event) can ever be completely described, there is a considerable difference between a description which leaves blank major areas of possible observation, or fails to organize what is observed into a coherent whole without internal contradictions, and one which is internally coherent and makes use of all available theoretical resources for the building of the observational frame of reference.

The theoretical model of disaster should specifically include space coordinates, to which other variables must be systematically related. In an unpublished memorandum (1953) I have suggested that in any disaster the following categories of spacial dimension can be mapped and distinguished by the various behaviors of their occupants with respect to the disaster:



For the time dimension, which should also be systematically related to behavioral and spacial variables, Powell and Rayner (1952) have suggested that "disaster time" can be divided into seven major periods (which may or may not overlap, and which may of course vary proportionately) which are characterized by the major type of activity occurring during each:

Pre- Disaster Condi- tions	Threat	Warning	Impact	Inventory	Rescue	Remedy	Recovery
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	1	2	3	4	5	6	7
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The sub-events constituting the total sequence of the disaster, involving both human behavior and physical happenings, must be plotted in both time and space according to some such schemas.

The behavior of social institutions in the disaster -- indeed, the behavior of the whole socio-cultural system -- must be described.

Rarely, if ever, does a disaster completely destroy a culture; but it does by definition render elements of it changed or inoperative for some people for some time, while other parts (including both "normal" and counter-measure organizations) may function at more or less optimum efficiency. In order to understand what the role of the community and its constituent organizations is, and what changes if any take place in them, it is necessary to reconstruct the pre-disaster state of these institutions and of the community structure generally.

In the area of generic human behavioral processes as distinct from the activities of institutions, such as panic, leadership, morale, rumor, flight reactions, etc., there is a considerable panel of possible phenomena which must be checked and if necessary described. In addition to these, there appears to be, at least in disasters where the impact is sudden and casualties and damage heavy, a quasi-pathological behavioral sequence, which I have called the "disaster syndrome," affecting at least a large proportion of persons in the impact area, and which may be paralleled by a complementary syndrome affecting many relief and rehabilitation workers from outside the impact area. This syndrome has been noticed, at various stages in its evolution (usually after the first few hours) by a number of observers in disaster areas, who have usually labelled it "apathy" or "shock." This syndrome,

on the case of the impact area population of Worcester, Mass., following the tornado of the summer of 1953, seemed on the basis of limited and impressionistic observation to take the following form for impact area survivors:

The impact itself was an unexpected, sudden, and overpowering trauma. People saw their own and their neighbor's houses damaged or destroyed; were themselves physically injured, in many cases; saw members of their household injured or killed. Immediately after the impact (the high wind velocities lasted for one or two minutes) they picked themselves up or did what they could to extricate themselves and care for their own injuries. There was no panic. Uninjured or slightly injured persons did what they could to aid their families; then they rushed out to assist neighbors. There was a general bustle of activity to rescue trapped persons and give first aid, coupled with intense concern for the welfare of other persons and property not one's own. This "altruistic" interest in the welfare of the community expressed itself in requests, on the part of many injured, that others be cared for before themselves. There was, on the other hand, a great need to be told that others were concerned about them, and to be told that friends and acquaintances were alive. Clergymen made the rounds of their parishioners, many of whom wept, kissed, embraced the cleric when he inquired after their welfare or informed them that he and

other acquaintances were all right. Among the injured taken to the hospitals, while there was little in the way of demanding or complaining, there was an unusual passivity and willingness to follow orders which persisted for days; there was also little concern with property losses and other practical problems facing them on discharge from the hospitals; among some survivors in the impact area who were not evacuated, there seemed to be a temporary sort of euphoria based on a sense of mutual cooperativeness and helpfulness and dedication to the task of restoring what had been destroyed. A number of persons with a reputation for neurotic symptomatology or a mental hospital history showed a noticeable remission of symptoms. Almost everyone is reported to have shared in the surge of concern for the welfare and restoration of familiar community objects and the care of neighbors. This temporary combination of relative blocking out of awareness of personal injury or loss, coupled with a great concern for the well-being of family, neighbors, and community landmarks (such as the churches) is no doubt based on unconscious mechanisms which determined the significance of the disaster for the affected population. One might speculate, for instance, that the apparent transplanting of affect from the self to others and to the physical environment represents a rather primitive mechanism of defense: that when the objects with which the individual has been identified are threatened, damaged,

or destroyed, the individual (not sure of his own capacity to survive unaided becomes anxious to assure himself that the whole supporting world has not collapsed. The syndrome might be compared to mild and transient traumatic neurosis.

The degree to which the Worcester situation is representative of human behavior in other types of disaster (where, for instance, the impact might be prolonged, as in an epidemic) or in other societies, is questionable. It would be desirable to know to what extent the disaster syndrome, and other behavioral manifestations, are cross-culturally variable, and to what extent it is a pan-human reaction only minimally modified by culture. In observing and organizing the data on a single disaster along the lines indicated above, and in formulating any general propositions involving typologies and the relationships of factors, certain principles of research methodology would seem to be implied:

- 1) An interdisciplinary approach. The problems of human behavior in extreme situations cross-cut many disciplines. Social psychology, psychiatry, history, anthropology, sociology, economics, political science -- concepts and research techniques from all of these should be focused on human behavior in extreme situations. It might also be stated as a matter of principle that no single event can be adequately described "in the round" from the standpoint of any single discipline as traditionally organized;

event-study requires either a team of researchers from several disciplines, or persons with skills in several.

2) A holistic approach. For the study of any specific disaster, a "jig-saw puzzle" approach to the reconstruction of the pattern or structure of that individual disaster is required. Information of many kinds must be organized on time and space coordinates, in accordance with a theoretical model of the ideal dimensions of disaster.

3) An analytical approach. The study of specific disaster variables (such as panic, spontaneous leadership, morale, the disaster syndromes, etc.) may of course profitably be done in experimental laboratories or in the clinic, or on the basis of field data which do not include observations along all the dimensions of the theoretical model. Generalization about such partial disaster phenomena should, however, be qualified by consideration of the total Gestalt; and prediction (or explanation) in specific natural instances must be made with the whole situation in mind.

4) An historical concept of causation. Critical factors determining what actually happens when a given impact strikes a community are likely to include elements of culture, demography, ecology, and particular social relationships and personalities which have their origin considerably farther back in time than the week or two preceding the impact itself. This is obvious in the

case of "slow" disasters like depressions, concentration camps, or even epidemics, but it is also true of brief and sudden impact situations (as may be recognized from the consideration of occasions when a given impact does not produce a disaster at all even though the same impact on other occasions has resulted in disaster). It is evident that the search for ultimate historical causes is an impracticable task, but some attention to a period of perhaps a generation preceding any disaster might be desirable, for two reasons: first, because events still within the memory (however distorted) of people concerned can be said to have an immediate determinative value; and secondly, that historical analysis can often reveal dimensions of a situation, and their importance, which are not apparent to a non-historically minded observer.

The number of special problems involving factors which operate in various ways in some extreme situations is of course considerable. In the course of preliminary reading, field observation, and thinking about the problem, the following have occurred to me as being especially worth attention:

a) The disaster syndrome. What are the conditions under which this syndrome occurs; what are the characteristics of the persons affected; what are its varieties and regularities? What is its relation to such clinical categories as wound shock, traumatic neurosis, operational fatigue, "war neurosis," etc. ?

b) Cultural differences. What is the role of differences in culture and sub-culture, and in national character, in determining differences in disaster behavior? When and in what areas of behavior do these differences occur, and (conversely) what elements of behavior can be called "pan-human"? To what extent do cultures define the same impact as possessing various degrees of extremity?

c) Accident-proneness. What is the role of accident-proneness in precipitating extreme situations for whole groups; the role of strategically located "disastrous personalities" (not necessarily clinically pathological or even prone to physical accidents) in establishing situations which become disastrous?

d) Communications. What happens to communications networks in various extreme situations; what kinds of network (both technologically and socially) affect the course of the extreme event, and in what ways?

e) Perception. What changes in perception occur in extreme situations; what are the determinants of these changes?

f) The "blackout" period. What are the psycho- and neuro-dynamics of the period (not seen in all people, and usually brief) immediately during and after a sudden and violent impact, when consciousness may be absent or limited and for which there is later total or partial amnesia, but during which neuromuscular coordination is effective enough for the carrying out of complex

motor activities. What determines the "automatic" behavior during this period?

g) Physiological stress. What are the determinants and functions of the "stress reaction" (involving ACTH production, etc.)?

What are the relationships between the types of "normal" situations to which the individual shows a stress reaction, and his reaction in disaster?

h) Identification and group dynamics. What are the triangular relationships between an individual's pattern of identifications with groups and objects; the damage done to these objects; and his and their behavior in the extreme situation? To what extent does identification with a professional disaster-relief or defense organization change the individual's reaction during impact; what is the role of morale and of leadership?

i) Panic. What are the determinants and conditions of panic and other forms of mass hysteria? Granted the same impact, under what conditions does panic not occur?

LIMITATIONS ON DISASTER RESEARCH

There are a number of factors which operate to reduce both the quantity and quality of research on disasters, and which as a practical matter can only partially be overcome:

1) Unobservability. Many types of disaster have an inherent

relative unobservability. An anthropologist can watch or participate in a religious ritual; a sociologist can attend a union meeting; the psychiatrist can see his patient a few hours or minutes after a family quarrel. But disasters, generally speaking, are so unpredictable as to place and time, that it is unlikely that any given team of trained observers will be in an impact area, before and during an impact of the appropriate type. (Some disasters, however, such as floods, epidemics, invasion and conquest, etc., can be predicted, or the period of impact is so long that observers can reach the area during impact). Furthermore, an extreme situation is likely to be as extreme for the participant observer as for anyone else; and if it is, he may be unable to make the desired observations, or to preserve his records.

2) You cannot interview the dead. Those who did not survive an extreme situation are as important subjects of investigation as those who did, and in order to answer the question, why did group A survive and not group B, some account ought to be taken of their behavior. But all interviewees are survivors (unless the observer can interview or observe some non-survivors before and during impact).

3) Time lag. In order to make an adequate study of a disaster, more information is likely to be required than can be obtained during the period of the disaster itself, especially if entry into the

impact area and access to local informants cannot be obtained immediately. Hence any disaster study becomes in part an historical study, with some resulting advantages, but some obvious disadvantages too in the way of loss of records, defects and distortions of memory, dispersal of informants, etc.

4) Relevance of clinical and laboratory observation. Generalizations from clinical and laboratory experience to practical disaster situations can undoubtedly contribute much, but the extent of relevance of clinical and laboratory findings is difficult to estimate because the total extreme situation cannot usually be reproduced in laboratory or clinic, and the analogousness of analogues is often a matter of opinion rather than of demonstration.

5) Emotional resistance of the researchers. Extreme situations elicit extreme emotions and extreme behavior. The researcher runs the gauntlet between being affectively swamped in the field situation and over-intellectualizing his approach. Any sort of field work has its emotionally strenuous moments and aspects: rejection by the subjects, over-identification with the subjects, antipathy toward the subjects, guilt over playing a passive or impersonal role in a situation where active assistance would be more appreciated, misunderstanding and mishandling of the subjects' transference behavior, etc. On the other hand, over-intellectualization, either by way of quasi-obsessional efforts to "interpret" behavior

in terms of some system of psychological or psychiatric terminology, or retreat behind a facade of methodological pseudo-rigorousness and a refusal to observe any but the grossest and least emotionally tinged dimensions of the event, can result in virtually useless work. Research on human behavior in extreme situations (and, indeed, any research on human behavior) requires a delicate balance of identification with the human objects of research and of intellectual detachment.

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SPECIFIC DISASTERS
FOR WHICH THE MOST USEFUL
DESCRIPTIVE BIBLIOGRAPHIES WERE COMPILED

Atomic weapons	Nagasaki, 1945; Hiroshima, 1945.
Bombing conventional	Bombing of Britain, 1940-45; bombing of Germany, 1940-45; bombing of Japan, 1942-45.
Combat	Battle of the Bulge, 1944; Braddock's defeat, 1755; Bull Run, 1861; Guadalcanal, 1942.
Earthquake	Bihar, India, 1934; Messina, 1909; Napier, N. Z., 1931; San Francisco, 1906; Tokyo, 1923.
Economic	U.S. Depression, 1907; U.S. depression 1929-37.
Epidemic	Black Death (14th Century); Yellow fever, Memphis, 1870; Yellow fever, Philadelphia, 1793.
Expatriation and Displacement	Evacuation of British cities, 1939-45; Spanish civil war refugees, 1936-39.
Explosions	Halifax, 1917; Texas City, 1947.
Famine	China, periodic famines; Greece, 1941-45; Holland, 1944-45; India, periodic famines; Russia, periodic famines.
Floods	Johnstown, Pa., 1889; Kansas-Missouri, 1951; Mississippi Valley, 1927; New England, 1927; Ohio Valley, 1937.
Fires	Chicago, 1871; Coconut Grove, 1942; Triangle Waist Fire, 1910.
Invasion and Conquest	Conquest and occupation of Germany, 1918; Conquest and occupation of Germany, 1945; Conquest and occupation of Japan, 1945.
Massacre and pogrom	Jewish pogrom, Germany, 1932-45; Jewish pogrom, Poland, 1919; Jewish pogrom, Russia, 1900-10; Turkish massacres, 1900-10.

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